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UNCLASSIFIED (White Book)

Defense Nuclear Agency
Fiscal Year 1994

Program Document

Research, Development, Test and Evaluation, Defense Agencies (U)

(Supports Congressional Budget Estimates)
April 1993

UNCLASSIFIED

FY 1994 BUDGET ESTIMATES

RESEARCH, DEVELOPMENT, TEST AND EVALUATION DESCRIPTIVE SUMMARIES

DEFENSE NUCLEAR AGENCY

APRIL 1993

FY 1994 BUDGET ESTIMATES

Program Element: #0602109H
PE Title: Superconductive Magnetic Energy Storage
Budget Activity: Technology Base
Date: April 1993

A. RESOURCES: ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Superconductive Magnetic Energy Storage (SMES)	40,000	20,000	- 0 -

B. BRIEF DESCRIPTION OF ELEMENT: SMES is a research and engineering effort to develop technology for storing electrical energy in superconducting coils. Superconducting materials have no electrical resistance when they are cooled to cryogenic temperatures. Consequently, electrical currents in the superconducting coils and their induced magnetic fields persist as long as the coils maintain their electrical integrity and superconducting properties. Electrical energy is stored in the magnetic field surrounding the coil and is available to satisfy large, instantaneous power requirements for military applications such as advanced directed and kinetic energy weapons as well as for commercial applications such as utility load-leveling. If approved by Congress, the development effort will culminate in the construction of a SMES 20 megawatt-hour (MWh) Engineering Test Model (ETM) to demonstrate the feasibility of a full-scale (5000 MWh) SMES facility. DNA is supported by the Department of Energy (DOE) in the management of the Congressionally-mandated SMES program.

C. JUSTIFICATION FOR PROJECT:

FY 1992 Accomplishments:
- Initiated 18 month program to identify and reduce cost, schedule, and technical risks.
- Initiated 12 month program to complete the Environmental Impact Statement (EIS).
- Initiated military and civilian application surveys.

FY 1993 Plans:
- Complete Environmental Impact Statement.
- Complete Applications Surveys.
- Complete risk reduction activities.
- Issue RFP for SMES ETM.

Work Performed By: Bechtel National Incorporated, San Francisco, CA; Ebasco Services Incorporated, New York, NY; Mobile District, U.S. Army Corps of Engineers, Mobile, AL; U.S. Department of Energy, Washington, D.C.

Related Activities: The U.S. Navy is exploring uses of SMES systems less than 1 MWh, and the U.S. Air Force is exploring uses of SMES systems less than 1/10 MWh. DOE is exploring uses of SMES systems less than 1 MWh and incorporating advanced technologies. There is no duplication.

Other Appropriation Funds: None.

International Cooperative Agreements: None.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Budget Activity: Technology Base
Date: April 1993

A. RESOURCES ($ in Thousands)

Project Number & Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate	Total Program
AA Underground Test	113,164	67,732	57,579	Continuing
AB Test & Simulation Technology	37,827	62,177	68,030	Continuing
AC Weapon Systems Lethality	57,994	66,961	41,226	Continuing
AD Biomedical/Lifesciences	17,169	17,142	-0-	Transferred
AE Weapon Safety & Operational Support	24,330	40,492	33,029	Continuing
AF Weapon Systems Operability	85,170	70,773	64,377	Continuing
AG Scientific Computations & Information Systems	21,992	41,345	22,496	Continuing
AH Counter Proliferation Technical Support	- 0 -	100	2,951	Continuing
AY Bioenvironmental Hazards Research	- 0 -	3,000	- 0 -	
AZ Los Alamos National Lab, Meson Physics Facility	- 0 -	15,000	- 0 -	
Total	357,646	384,722	289,688	

B. BRIEF DESCRIPTION OF ELEMENT: This program develops the technology base for operability and effectiveness of U.S. defensive and offensive systems and forces, plus the associated command, control, communications, and intelligence (C3I) assets. With the end of the cold war, a nuclear engagement between superpowers is increasingly unlikely; more likely is a regional conflict involving one or more adversaries that possess nuclear, biological or chemical (NBC) weapons. Deterring the proliferation of NBC weapons by rogue nations is paramount; but, should deterrence fail, the U.S. must possess forces to respond to a proliferator's use or threatened use of NBC weapons. It is also imperative to preserve survivable, effective forces as a hedge against a resurgent of the Former Soviet Union or any other nation aspiring to nuclear superpower status.

This new world order places a premium on defensive systems that can survive and operate without interruption in a nuclear environment. Especially critical are space-based sensor and communication platforms. It also requires that the U.S. possess a set of discriminate conventional and nuclear weapons to effectively attack an aggressor's most precious assets with minimal collateral effects, even if those assets are protected in hardened underground structures.

To meet stated objectives, DNA is restructuring its work to eliminate activities based solely on cold war threats, and to meet the challenges of regional conflict contingencies. Specifically, the development of more capable aboveground radiation simulators will be accelerated; one additional underground test is planned in FY 1995 to validate correlations between simulated and underground test environments and to verify reliability and operability of critical space-based C3I systems; new activities are planned to support DoD counter proliferation responsibilities and U.S. nuclear weapon safety and security are receiving added emphasis. Efforts encompass:

- Development and operation of simulators (radiation, blast, thermal, radio propagation and optical background effects) to evaluate nuclear weapon effects on military systems.
- Development of theoretical and experimental techniques for predicting the prompt and enduring environments created by endo- and exo-atmospheric explosions and the response of military systems operating in these environments.

- Development of hardness design methodologies and hardness assessment tools to support the acquisition of survivable weapon systems.
- Development and validation of a design and testing methodology to underwrite the survivability of defensive and offensive systems with minimal reliance on underground testing.
- Evaluation of weapons effectiveness against hardened underground facilities associated with the proliferation of weapons of mass destruction throughout the world.
- Utilization of weapons effects information to support development of adaptive targeting methodologies.
- Conduct of quantitative safety assessments of stockpiled nuclear weapons systems and development and maintenance of nuclear weapons system safety data bases.
- Technical activities to underwrite DoD counter proliferation programs.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AA
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Underground Test	113,164	67,732	57,579

B. BRIEF DESCRIPTION OF PROJECT: The Defense Nuclear Agency will conduct one underground nuclear effects test in FY 1995. The 1995 test will be designed to allow reuse of the testbed at a significantly lower cost and to place the program in standby status after either one or two tests. This will maintain the capability to resume underground nuclear effects testing in the future and comply with environmental safety and health standards. The primary purpose of the FY 1995 test is to develop a correlation between results obtained from underground nuclear effects tests and those from aboveground nuclear effects simulation testing. This correlation is imperative because the U.S. may become totally dependent on simulators to address the operability and reliability of its military systems in a nuclear environment. In addition, the scheduled test will meet DNA customers' highest priority reliability test requirements. These requirements encompass: (1) reliability testing of strategic missile reentry systems that will remain in the U.S. inventory after START reductions; (2) survivable communication, navigation, sensor seekers, and intelligence systems necessary for national security; and (3) the nuclear effects qualification of new nuclear weapon safety and security features prior to their incorporation into the U.S. nuclear weapon inventory.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1992 Accomplishments:
- Conducted an underground nuclear cavity test to better understand nuclear air blast over real surfaces and assess lethality criteria for hardened underground facilities.
- Conducted a full system level radiation test to evaluate the reliability of space systems (optics, seeker/sensors, focal plane arrays, and components of advanced defense and offense systems).
- Began program to exploit state-of-the-art fiber optic technologies to improve data acquisition capabilities.

FY 1993 Plans:
- Continue underground testbed design, fabrication and construction for radiation tests scheduled for 1995 (MIGHTY UNCLE) and plan for a possible future test.
- Close all but one tunnel complex.
- Conduct environmental cleanup in the tunnel complexes to be closed.

FY 1994 Plans:
- Continue underground testbed design, fabrication and construction for radiation tests scheduled for 1995 (MIGHTY UNCLE) and plan for a possible future test.
- Continue environmental cleanup in the closed tunnel complexes and surrounding area.

Work Performed By: Lockheed Missile & Space Corporation, Sunnyvale, CA and Huntsville, AL; Science Applications International, Inc., San Diego, CA; EG&G Energy Measurements, Inc., Las Vegas, NV; S-Cubed, La Jolla, CA; Department of Energy, Nevada Operations Office, Las Vegas, NV; Lawrence Livermore National Laboratory, Livermore, CA and Los Alamos National Laboratory, Los Alamos, NM.

Related Activities: This project is conducted in coordination with the Director of Test and Evaluation, Chairman, Joint Chief of Staff, STRATCOM, Military Departments, Strategic Defense Initiative Organization, and Commanders in Chief of Unified and Specified Commands to satisfy system and operational requirements. There is no duplication.

Other Appropriation Funds: None.

International Cooperative Agreements: Joint Working Group 26.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AB
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Test & Simulation Technology	37,827	62,177	68,030

B. BRIEF DESCRIPTION OF PROJECT: This project provides the non-nuclear simulation test facilities and technologies that are used by the Services to evaluate the performance and operability of DoD systems across the spectrum of nuclear environments. Aboveground simulation facilities support DoD test requirements for high explosive (HE), radiation, blast/thermal, communications link and optical background effects. This project funds the operations, maintenance and upgrades of the aboveground nuclear weapons effects radiation simulators for x-ray, gamma ray, and electromagnetic pulse effects; the DNA Tri-Service Thermal Radiation Test facility; and the future Large Blast Thermal Simulator (LBTS). The project also includes the development of the simulation technologies that are needed to reduce future reliance on underground testing. In recognition of the need for an aggressive program in this area, this project has been enhanced to allow for acceleration of the development of non-nuclear simulators with the goal of satisfying most of the projected nuclear effects test requirements by the year 2002. This strategy requires the development of "testable hardware," funded under Project AF, which complies with constrained hardening design procedures that allow verification via aboveground simulators. This project will develop the requisite hardware testing protocols.

This project includes the continued development of (1) the DECADE x-ray simulator, which will be operational by FY 1996 and will satisfy most requirements for electronics testing with hard x-rays; (2) radio propagation effects simulators, and (3) infrared and optical scene generators. This project also supports the initiation of a joint program with the Department of Energy, Sandia National Laboratories, to develop JUPITER, an advanced soft x-ray simulator that will satisfy most of the projected nuclear underground testing requirements for materials, optics and structures. The project also includes the development of the innovative enabling technologies in pulsed power, electrical switches, radiation sources and high energy density capacitors that future nuclear effects simulators will require. This project will also closely monitor the technical progress of Inertial Confinement Fusion (ICF) technologies and capitalize on potential breakthroughs as they occur.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1992 Accomplishments:
- Initiated construction of LBTS.
- DECADE simulator contract awarded; DECADE building design completed; building construction contract out for bids.
- Demonstrated DECADE inductive energy storage prototypes.
- Supported development and hardness validation testing for the Services military weapons systems and surveillance systems.
- Completed development of a Nuclear Infrared Clutter Simulator.
- Initiated development of a Nuclear Optical Dynamic Display System.

FY 1993 Plans:
- Conduct three HE tests to evaluate ground shock propagation and structural survivability.
- Complete construction of the LBTS and the ARES simulator upgrade.
- Fabricate and test first full-scale DECADE module.
- Continue development of a Nuclear Optical Dynamic Display System.
- Continue x-ray source optimization, fidelity and cryogenic modifications to simulators to improve reliability, and efficiency.
- Begin technology development for JUPITER.
- Initiate conceptual design of ICF facility for nuclear effects testing.
- Provide radiation simulator test beds for validating system-level hardness in support of Service requirements.

FY 1994 Plans:
- Complete facility characterization of the LBTS.
- Execute seven ground shock effects tests.

- Procure prototype hardware for the new large area thermal simulator.
- Bring ARES on line for full scale High Altitude Electromagnetic Pulse simulator system testing to DoD Stnd 2169A.
- Complete the fabrication and assembly of the first four modules of the DECADE Simulator and the building construction.
- Continue technology development for JUPITER.
- Complete the Nuclear Optical Dynamic Display System.
- Identify shortcomings and upgrade requirements of radiation simulators based on Aboveground Test/Underground Test (AGT/UGT) correlation data base.
- Support AGT/UGT correlation study of electronic box response dependence upon direction of radiation source.

Work Performed By: Science Application Incorporated, San Diego, CA; Maxwell Laboratories, Inc., San Diego, CA; Mission Research Corporation, Santa Barbara, CA; Physics International Company, San Leandro, CA; General Electric, Valley Forge, PA; Honeywell, Inc., Minneapolis, MN; Bendix Field Engineering Corp., Columbia, MD; University of Dayton, OH; various DoE and DoD Service Labs; White Sands Missile Range, NM.

Related Activities: This project is conducted in coordination with the Office of the Secretary of Defense, Director of Test and Evaluation, Chairman, Joint Chiefs of Staff, Military Acquisitions Departments, Strategic Defense Initiative Organization, US Space Command, US Army Strategic Defense Command, Commanders in Chief of Unified and Specified Commands. There is no duplication.

Other Appropriation Funds: Program element 0602715H, Project #000092, DECADE Simulator (MILCON), and Project #000091, Large Blast Thermal Simulator (MILCON).

International Cooperative Agreements: Foreign Military Sales cases and Technical Exchange Agreements among our NATO Allies and the French government.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AC
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Weapon Systems Lethality	57,994	66,961	41,226

B. BRIEF DESCRIPTION OF PROJECT: This project develops lethality criteria for the full spectrum of conventional and nuclear weapons, including precision guided conventional and nuclear munitions, fuel air explosives, and electrothermal chemical (ETC) guns. The target base includes hard and superhard buried facilities, underwater targets, and missiles. The program seeks to quantify lethality in terms of functional and physical kill criteria for the response of critical high value targets to attacks from conventional and nuclear weapons. This project also evaluates the collateral effects resulting from such attacks with emphasis on the implications associated with targeting Nuclear, Biological and Chemical (NBC) weapon facilities. This project will develop an automated expert system to assist in pre-strike target planning and post-strike battle damage assessment. The understanding of weapon-target interaction resulting from this project will assist in generating weapon development requirements against the changing worldwide target base and provide a quantitative basis for contingency operations involving weapons of mass destruction.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1992 Accomplishments:
- Archived DESERT STORM textual and visual data relating to weapons effects and performance in a multimedia data base.
- Initiated development of an expert system for target planning and battle damage assessment.
- Initiated development of a Joint Service Manual for the design and analysis of hardened structures against conventional weapons effects.
- Conducted calculations of airblast/thermal and fragment environments from conventional weapons.
- Executed 22 conventional weapons effects tests against hardened facilities.
- Demonstrated Electrothermal-chemical (ETC) gun with a world record performance (25.8 Kg @ 1.1 km/s).
- Performed trade-off calculations to evaluate the effectiveness of nuclear and conventional munitions in a theater missile defense role.
- Initiated efforts to characterize site geologies for prospective worldwide underground targets.
- Initiated construction of underground tunnels at Ft. Knox to investigate vulnerability of deep underground facilities to ground shock loading.
- Conducted successful non-ideal airblast experiments on the DIAMOND FORTUNE underground cavity nuclear test.
- Completed submarine precision model tests to assess fluid-structure interaction for double hull submarines.

FY 1993 Plans:
- Conduct full-scale operational validation of prototype automated target planning system for one target type.
- Execute 31 precision conventional weapons effects tests to validate lethality criteria.
- Issue preliminary lethality criteria for low yield nuclear warhead against the threat of chemical/biological/nuclear theater ballistic missile warheads.
- Conduct laboratory and field experiments to evaluate dispersal hazards from strikes on chemical/biological/nuclear weapons-related ground facilities.
- Commence testing to investigate shock effects of undersea bottom mines against shallow water targets.
- Conduct full-scale ETC gun feasibility demonstration.
- Develop advanced numerical methods for predicting dispersal of hazardous chemical/biological/radioactive clouds.
- Initiate study to evaluate dispersal hazard risk from strikes on nuclear reactors.
- Screen candidate sensors for hard target battle damage assessment.

FY 1994 Plans:
- Initiate target response modeling to high/hypervelocity projectiles.
- Conduct field tests to assess the collateral damage resulting from strikes on Nuclear, Biological and Chemical facilities.
- Incorporate non-visual damage signatures into battle damage assessment methodology.
- Publish the Joint Services Manual for the design and analysis of hardened structures to conventional weapons effects.
- Execute 10 precision conventional weapons tests against hardened structures.
- Field test existing sensor technology to assist in battle damage assessment of fixed hard structures.
- Optimize Electrothermal-chemical gun design for Service applications.
- Perform testing and analysis of shock induced submarine damage rules at all operating depths.
- Demonstrate computational effectiveness of boundary elements in layered media.
- Perform targeting effectiveness calculations in support of nuclear versus conventional trade-off studies for regional contingency planning.

Work Performed By: Science Applications International Corp., Alexandria, VA; Weidlinger Associates, New York, NY; S-Cubed, La Jolla, CA; Applied Research Associates, Inc., Albuquerque, NM; California Research & Technology, Inc., Chatsworth, CA; SRI International, Menlo Park, CA; APTEK, Colorado Springs, CO; AMI Research, Mystic, CT; BDM International, McLean, VA; Horizons Technology, San Diego, CA; Orlando Technology, Inc., Shalimar, FL; RE/SPEC, Rapid City, SD; Southwest Research Institute, San Antonio, TX; Applied Research Institute, South Royalton, VA; Karagozian and Case, Los Angeles, CA; DoD and DOE government laboratories.

Related Activities: This project is conducted in coordination with the Air Combat Command, STRATCOM, Strategic and Theater Nuclear Forces, Chairman, Joint Chiefs of Staff, Military Departments, Defense Intelligence Agency, Strategic Defense Initiative Organization and Commanders in Chief of Unified and Specified Commands. There is no duplication.

Other Appropriation Funds: None.

International Cooperative Agreements: United Kingdom - Joint Working Groups 36 and 43.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AD
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Biomedical/Lifesciences	17,169	17,142	- 0 -

B. BRIEF DESCRIPTION OF PROJECT: This program is the only in-house Department of Defense (DoD) effort that investigates the biomedical effects of radiation from nuclear weapons accidents or environmental contamination. This unique research is conducted by the Armed Forces Radiobiology Research Institute (AFRRI), which is scheduled to be transferred to the Uniformed Services University of the Health Sciences effective FY 1994. AFRRI is the leading DoD authority on radiation effects and is dedicated to research to support the requirements of the Surgeons General of the Armed Forces. The requirements related to nuclear proliferation and radionuclide contamination emphasize strategies to: 1) increase survival of personnel through use of radioprotective drugs given before irradiation and/or use of new modalities for treatment of radiation casualties, 2) minimize delirious effects, such as cancer and mutations that may result from radiation exposures encountered on earth or in space, and 3) maintain operational performance such as controlling a vehicle (aircraft, ship, or tank).

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1992 Accomplishments:
- Determined the neurochemical changes produced by gamma rays, neutrons and charged particles.
- Developed therapeutic protocols to enhance bone marrow recovery.
- Refined list of chemicals which increase resistance to radiation damage.
- Completed microdosimetry model of acute bone marrow damage.

FY 1993 Plans:
- Describe radiation effect on muscular fatigue and weakness.
- Develop treatment protocol to control immune suppression.
- Identify drug combinations which enhance survival and maintain performance.
- Initiate cancer studies in VIVO/in VITRO on heavy charged particles.
- Initiate program on microwave bioeffects.

Work Performed By: The National Academy of Sciences, Washington, DC; Merrifield Laboratory, Inc., Merrifield, VA; National Aeronautics and Space Administration, Langley Research Center, Hampton, VA; Lawrence Berkeley Laboratory, Berkeley, CA; National Institute of Science and Technology, Gaithersburg, MD; and the Uniformed Services University of Health Sciences, Bethesda, MD.

Related Activities: None.

Other Appropriation Funds: None.

International Cooperative Agreements: AFRRI has the following Memoranda of Understanding: began in 1982 and is an on-going project - Centre de Recherches du Service De Sante des Armees (DEA 1125), France, to conduct research on the mechanism of radiation damage from nuclear weapons; began in 1986 and is an on-going project - Defense Research Organization, Netherlands, (DEA 0096), to exchange information on physical, biological, and medical aspects of radiations associated with nuclear devices and other radiation sources.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AE
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Weapon Safety & Operational Support	24,330	40,492	33,029

B. BRIEF DESCRIPTION OF PROJECT: This project: (1) improves nuclear weapons safety and survivability, employment planning, command and control, force structure, and force effectiveness; (2) addresses the contribution of nuclear weapons effects to strategic nuclear employment objectives; (3) develops alternative strategies for U.S. strategic weapons employment; (4) includes research to improve planning capabilities that provide nuclear commanders with more flexible weapons employment options; and (5) explores technology needed to enhance theater U.S. and Allied command operations on an integrated battlefield.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1992 Accomplishments:
- Continued the quantitative Weapon System Safety Assessment (WSSA) of the MMIII/W78 weapon system.
- Conducted a WSSA excursion of the W87 system.
- Initiated Fire Resistant Enhancement (FRE) study of the Stockpile.
- Provided technical assessment support to the Nuclear Weapons Council (NWC) and Department of Defense offices responsible for nuclear weapons safety and operations.
- Completed construction of proof-of-principle demonstrator of Transportable Storage System.
- Provided continued support of Lateral Dispersal to SHAPE.
- Completed study of impact of Deceptive Practices (DP) during combat operations in Gulf War on Naval forces.
- Transitioned Automated Target Tie-Up system to STRATCOM.
- Completed nuclear weapons effects upgrade for Multiple Engagement Module.
- Installed NATO Nuclear Planning prototype.

FY 1993 Plans:
- Complete the MMIII/W78 WSSA.
- Initiate development of the WSSA Information Management System.
- Continue FRE study of the stockpile.
- Initiate follow-up program to exploit DP technologies for Naval/Joint DoD use.
- Complete Allied Command Europe Survivable Nuclear Command and Control Program; Transition to NATO.
- Complete effort on Transportable Storage System.
- Evaluate the NATO Nuclear Planning System during exercises.
- Assess survivability and effectiveness impacts of changes to force structure required by new U.S. nuclear strategy Quick Look III/Strategic Force Posture.
- Continue to provide safety assessment support to the NWC.
- Deliver Automated Routing and Maintenance System Version 3.0 to STRATCOM.

FY 1994 Plans:
- Continue nuclear stockpile FRE and WSSA Information Management System.
- Initiate W80 WSSA.
- Initiate examination for Command and Control issues.
- Complete assessment and plan for proof-of-principle demonstration of TSC-V Reentry Vehicle Safety container.
- Complete Dual Capable Aircraft Prelaunch Survivability study supporting NATO.
- Complete Weapons Secure Storage System regeneration testing with USAFE/SHAPE.
- Complete SHAPE Nuclear Planning System (NPS) and NATO NPS; transition to SHAPE/NATO.
- Begin development of near real-time Routing and Maintenance to support Adaptive Planning Systems.
- Complete program to exploit DP technologies for Naval/Joint DoD use.

Work Performed By: Science Applications International Corporation, La Jolla, CA; R&D Associates, Mons, Belgium; Lawrence Livermore National Laboratory, Livermore, CA; Sandia National Laboratory, Albuquerque, NM; Booz-Allen and Hamilton, Bethesda, MD, General Dynamics/CONVAIR Division, San Diego, CA; Analytical Systems Engineering Corp., Burlington, MA; Logicon Inc., San Pedro, CA; Applied Research Assoc., Alexandria, VA; Mitre Corp., Bedford, MA; Science Control Technology Corp., Los Angeles, CA.

Related Activities: This project is coordinated with Director of Strategic and Theater Nuclear Forces, Assistant to the Secretary of Defense (Atomic Energy), Defense Intelligence Agency and Commanders in Chief of Unified and Specified Commands to support various systems (Cruise Missiles, KC 135, SRAM, B52, B1, B2). There is no duplication.

Other Appropriation Funds: None.

International Cooperative Agreements: None.

FY 1994 BUDGET ESTIMATES

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AF
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Weapon Systems Operability	85,170	70,773	64,377

B. BRIEF DESCRIPTION OF PROJECT: This project provides the technology base and support to ensure that current and future DoD Systems such as Command, Control, Communications, Computers and Intelligence (C4I) systems, aircraft and missile defensive systems, as well as personnel can survive and operate effectively through the spectrum of conventional and nuclear weapon-disturbed environments. Planned efforts will place particular emphasis on developing the technology to preserve the "functional" survivability to combined hostile effects from low intensity nuclear conflict. Because DoD acquisition policy is to rely on commercial, multi-use technology whenever possible, it is essential to develop and demonstrate affordable, hardening and mitigation technologies that can be transferred to industry, the Services and system acquisition programs. The principal products from this project include radiation-resistant memories and computers; DoD-mandated environment and design guidelines and standards for nuclear survivable systems; nuclear environment avoidance and nuclear weapons effects hardening and mitigation techniques; correlations between aboveground and underground testing methodologies to support the hardness validation of electronics, optics materials and structures; development of "testable hardware" designed to be validated without the use of Underground Tests; and the unification of risk and casualty assessment models, training tools, and methods for evaluating soldier performance degradation to nuclear, biological, chemical and conventional effects.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1992 Accomplishments:
- Initiated design of 1-megabit memory for Radiation-Hardened Space Computer.
- Completed draft of a handbook (MIL-HDBK-423) for high altitude electromagnetic pulse (HEMP) effects on groundbased C4I systems.
- Completed development of DoD's first magnetohydrodynamic (MHD) HEMP pulser; conducted MHD HEMP test at FEMA site in Olney, MD; initiated development of novel high power microwave sources.
- Evaluated PAVE PAWS radar using communication link simulator.
- Defined nuclear environments for Follow-on Early Warning System (FEWS), Brilliant Eyes (BE), Regency Net, the Defense Satellite Communications System (DSCS) Replenishment Program, and Theater High Altitude Air Defense.
- Provided new radiation shielding transport code and troop safety and casualty criteria to the Army and NATO allies.
- Initiated the development of aircraft sensors that will differentiate dust clouds from natural weather.
- Completed nuclear hardness assessment of space optics at operational (cryogenic) temperatures based on underground test data.

FY 1993 Plans:
- Complete design of radiation-hard 1-megabit memory for space applications and begin technology evaluation for 4-megabit memory.
- Conduct HEMP tests at Strategic Command's Alternative Processing Correlation Center and Army SATCOM facilities.
- Complete development of preliminary high power microwave source.
- Complete formal revision of DoD's official standard for HEMP.
- Continue nuclear environments support to FEWS, BE and DSCS.
- Evaluate HEMP effects in regional contingency scenarios.
- Conduct field trials of anti-emetic oral medication.
- Initiate virtual reality program to incorporate human factors into combat simulation training and evaluation tools.
- Evaluate survivability of PACOM aircraft shelters.
- Complete dust environment prediction methodology.
- Complete engine dust ingestion and air data sensor testing.
- Quantify radiation effects on hardened optics and publish design guidelines for Special Project Office use.

- Deliver software for Strategic Command to perform aircraft mission planning in nuclear environments.
- Initiate development of radiation-hardened cryogenic analog circuits for Infrared focal-plane applications.
- Test Ground Nuclear Detection System Terminal using Nuclear Effects Link Simulator.
- Start evaluation of PAVE PAWS phased array radar.
- Devise baseline concepts of design and test protocols for application to Testable Hardware Electronic System Demonstration.
- Conduct GAMBLE III Ion Beam Active Optic Experiment.

FY 1994 Plans:

- Fabricate and evaluate 1-megabit static random access memory circuits.
- Continue DoD standard for radar and communications system hardening.
- Initiate final proof-of-concept high power microwave sources; demonstrate effectiveness in generic system tests.
- Develop conceptual designs for hardened electronic and electro-optical space systems that can be validated in non-nuclear radiation simulators.
- Complete test and mitigation support for Universal Modem, Global Positioning System, and the Nuclear Detection System.
- Complete field trials of anti-emetic medication; issue new casualty prediction tool for Services' use.
- Apply survivability validations methodology to aircraft and cruise missiles systems.
- Test the Ground-Based Radar using the Radar Nuclear Effects Propagation Simulator.
- Initiate proof-of-principle tests on "testable hardware" designed to be validated without UGTs.
- Initiate fabrication of test object to implement "testable hardware" concepts on MIGHTY UNCLE UGT.
- Conduct E-Beam Complex Cryo-Mirror Experiment.
- Perform MOSAIC HUBBLE Telescope System Assessment Demo.
- Plan optics/critical tolerance structures AGT/UGT correlation experiment for MIGHTY UNCLE in FY 1995.

Work Performed By: Mission Research Corp., Santa Barbara, CA; Science Applications International Corp., Joppa, MD & Vienna, VA; Pacific Sierra Research Corp., Santa Monica, CA; JAYCOR, San Diego, CA; Los Alamos National Lab, Los Alamos, NM; Oak Ridge National Lab, Oak Ridge, TN; Sandia National Lab, Albuquerque, NM; US Army Strategic Defense Command, Huntsville, AL; US Air Force Phillips Lab, Albuquerque, NM; Naval Research Laboratory, Washington, DC; US Army Harry Diamond Laboratory, Woodbridge, VA; National Academy of Sciences, Washington, DC; BDM, International, McLean, VA; Kaman Sciences, Colorado Springs, CO; Calspan, Buffalo, NY; Texas Instruments, Dallas, TX; Honeywell, Minneapolis, MN; IBM, Manassas, VA; K-Tech, Albuquerque, NM; S-Cubed, La Jolla, CA.

Related Activities: This project is conducted in coordination with the Office of the Secretary of Defense, Chairman, Joint Chiefs of Staff, Military Departments, Strategic Defense Initiative Organization, Defense Information Systems Agency, Defense Intelligence Agency, National Security Agency, and Commanders in Chief of Unified and Specified Commands. There is no duplication.

Other Appropriation Funds: None.

International Cooperative Agreements: Joint Working Groups 35 and 36.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AG
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Scientific Computations & Information Systems	21,992	41,345	22,496

B. BRIEF DESCRIPTION OF PROJECT: This project provides the supercomputer (CRAY XMP/416) data base and modeling resources that enable DNA's RDT&E contractors to perform research into all aspects of weapons effects. The CRAY is used as an aid to the basic understanding of the exceedingly complex and interrelated physical phenomena that occur during and after a nuclear explosion. Calculations, models and codes are developed and used to aid the design of experiments, predict types and levels of measurements required, establish system design requirements and assess performance, and provide system-specific predictions of nuclear weapons effects to DoD planners. The principle thrust of the scientific computing activity is to conduct numerical simulation for shock effects of nuclear weapons; nuclear survivability and hardness of structures; radiation effects of nuclear weapons on communications systems, radars, and infrared and optical systems; and the effectiveness of conventional weapons. This project disseminates DNA research results by developing user-friendly interactive data bases, technical archives, and design aids for system developers.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1992 Accomplishments:
- Continued to provide supercomputer scientific computing resources.
- Provided upgraded telecommunications circuits for the network.
- Completed High Performance Supercomputer Alternative Site Survey.
- Provided visualization support to improve analysis of results.
- Continued transition to the CRAY UNIX operating system.

FY 1993 Plans:
- Continue to provide supercomputer resources by replacing the current CRAY XMP supercomputer used to support contractor research.
- Establish tightly integrated Wide Area Network to interconnect DNA scientists, contractor researchers, other government agencies, and university sites to effectively support DNA research projects.
- Continue implementing visualization systems and techniques display.
- Complete transition to the CRAY UNIX operating system.
- Develop Data Archival and Retrieval Enhancement (DARE) system for Nuclear Weapons Effects data base.
- Begin research for establishing DNA's Defense Simulation Internet (DSI) Node.
- Disseminate user-friendly computational and archival information products.

FY 1994 Plans:
- Continue to provide state-of-the-art supercomputer resources through full utilization of the new supercomputer's unique capabilities.
- Acquire peripheral hardware and software to support improved remote visualization via the simulation of models and code results.
- Begin upgrade of communications network backbone to the T-3 level.
- Operate DSI node allowing complete interaction in the modeling and simulation arena.
- Populate DARE system with Nuclear Weapons Effects data and disseminate updated information products.

Work Performed By: Department of Energy, Albuquerque, NM; Los Alamos National Laboratory, Los Alamos, NM; Pacific Sierra Research, Los Angeles, CA; S-Cubed, Albuquerque, NM, San Diego, CA.

Related Activities: None.

Other Appropriation Funds: None.

International Cooperative Agreements: None.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: AH
Budget Activity: Technology Base

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Counter Proliferation Technical Support	- 0 -	100	2,951

B. BRIEF DESCRIPTION OF PROJECT: This project responds to the President's July 1992 initiative on Non-proliferation to combat the spread of weapons of mass destruction (WMD), (i.e., nuclear, biological, chemical (NBC) weapons and ballistic missiles). This project draws from current and past DNA research efforts and provides technical support to DoD and other organizations involved in all aspects of counter proliferation.

Deterrence Phase:
- Supports the Office of the Secretary of Defense (Policy) (OSD(P)) by conducting technical analysis of licensing applications and developing a net assessment of proliferation.
- Exploit technologies and data bases from arms control treaty verification activities to support proliferation monitoring.

Containment Phase:
- Evaluate and develop high confidence on-site inspection regimes.
- Assess safety, security and command/control of NBC materials or weapons in the possession of potential or actual proliferators.
- Develop avenues for sharing technologies and other data with countries joining the U.S. in international non-proliferation activities.
- Assist in training/equipment of International Inspectors.

Neutralization Phase:
- Support contingency planning for potential regional conflicts involving nations with NBC capabilities.
- Assess post-attack implications of collateral effects, associated with targeting NBC facilities, on theater military operations and evaluate hazards to civilian populations.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1993 Plans:
- Assess the technical and operational impact of regional proliferation. Determine impact on the survivability of U.S. Forces.
- Support STRATCOM and OSD (Net Assessments) in gaming strategies pertaining to strategic use of conventional and nuclear weapons in regional contingency scenarios.

FY 1994 Plans:
- Provide export control support to OSD and Office of the Joint Chiefs of Staff (OJCS).
- Provide technical support to OSD(P), OJCS, and Commander in Chief of Unified and Specified Commands (CINCs).
- Develop a running net assessment for export controls.
- Develop, test and evaluate technical equipment for treaty and special operations use.
- Provide force response options for methods of attack on a specific region or country's WMD facilities, including underground storage and production sites. Options will minimize collateral damage.
- Provide Battlefield Management Tools in evaluating NBC attacks on CINCs.

Work Performed By: Science Applications International Corporation, San Diego, CA; Logicon R&D Associates, Marina Del Ray, CA; BDM International Incorporated, McLean, VA; Kaman Sciences Corporation, Colorado Springs, CO; Lawrence Livermore National Laboratory, Livermore, CA; Los Alamos National Laboratory, Los Alamos, NM; and Sandia National Laboratory, Albuquerque, NM.

Related Activities: None.

Other Appropriation Funds: None.

International Cooperative Agreements: Non-Proliferation Treaty, Treaty on Open Skies, Chemical Weapons Convention, and Threshold Test Ban Treaty Protocol, the 17 Nunn-Lugar "umbrella agreements" and specific agreements with the Former Soviet Union.

Program Element: #0602715H Project Number: AY
PE Title: Defense Nuclear Agency Budget Activity: Technology Base

A. RESOURCES: ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Bioenvironmental Hazards Research	- 0 -	3,000	- 0 -

B. BRIEF DESCRIPTION OF PROJECT: This project provides for bioenvironmental hazards research activities to enable DoD to strengthen its efforts in developing technologies to protect DoD personnel, the civilian population and the environment from potential hazardous substances DoD generates and uses. Funds were provided as a Congressional addition to the FY 1993 President's Budget Submission and are intended to continue efforts begun by a grant in FY 1989 to Tulane and Xavier Universities.

C. PROGRAM ACCOMPLISHMENT AND PLANS:
FY 1993 Plans:
- Conduct research in the following areas related to bioenvironmental hazards of interest to DoD: genotoxicity, composting of munitions contaminated soil, treatment of waste water, contamination detection, and development of alternatives to hazardous chemicals.

Work Performed By: Tulane University, New Orleans, LA; Xavier University, New Orleans, LA.

Related Activities: None.

Other Appropriation Funds: None.

International Cooperation Agreements: None.

Program Element: #0602715H
PE Title: Defense Nuclear Agency
Project Number: A2
Budget Activity: Technology Base

A. RESOURCES: ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Los Alamos National Lab, Meson Physics Facility	- 0 -	15,000	- 0 -

B. BRIEF DESCRIPTION OF PROJECT: This project provides for the upgrade of the Los Alamos National Laboratory Meson Physics Facility (LAMPF), significantly enhancing the capabilities for Department of Defense (DoD) and other applications requiring a medium-energy, high current accelerator. Funds were provided as a Congressional addition to the FY 1993 President's Budget Submission.

C. PROGRAM ACCOMPLISHMENT AND PLANS:

FY 1993 Plans:

- Design and fabrication of an acceleration test stand called the Accelerator Performance Demonstration Facility and perform a comprehensive evaluation of the additional changes that would be needed to increase the average current and beam power of the LAMPF accelerator by up to a factor of 10.
- Conduct a feasibility study using LAMPF as part of an Integrated Test Facility for testing and evaluating the technologies required for the accelerator based conversion (transmutation) of surplus plutonium and radioactive waste products.
- Conduct a pre-conceptual design study of a facility extension at LAMPF that would produce intense, narrow bursts of neutrons and gammas for DoD testing programs.

Work Performed By: Los Alamos National Laboratory, Albuquerque, NM.

Related Activities: None.

Other Appropriation Funds: None.

International Cooperative Agreements: None.

Program Element: #09016000 Budget Activity: Technology Base
PE Title: Contract Administration/ Audit Date: April 1993

A. RESOURCES: ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Contract Administration/Audit	- 0 -	- 0 -	5,534

B. BRIEF DESCRIPTION OF PROJECT: The FY 1994 budget reflects the portion of the Department's estimate as a result of contract awards made in this appropriation. This represents a change from the way the budget was presented last year and reflects a Congressional and Departmental initiative to move toward mission budgeting which calls for an improved method of budgeting and justifying resources. The visibility of total costs related to contract awards and administrative requirements is improved in this presentation because support service funding for related contracts is included in this appropriation.

C. JUSTIFICATION FOR PROJECT:
FY 1994 Plans:
- These funds will be used to finance contract services that are performed in support of program budgeted in this appropriation.

Work Performed By: Defense Contract Audit Agency.

Related Activities: Not applicable.

Other Appropriation Funds: Not applicable.

International Cooperative Agreements: Not applicable.

FY 1994 BUDGET ESTIMATES

Program Element: #0602790H
PE Title: Small Business Innovative Research
Budget Activity: Technology Base
Date: April 1993

A. RESOURCES: ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Small Business Innovative Research	- 0 -	4868	3851

B. BRIEF DESCRIPTION OF ELEMENT: This project is to stimulate technological innovation in the private sector, strengthen the role of small business in meeting DoD research and development needs, foster and encourage participation of minority and disadvantaged business in technological innovation, and increase the commercial application of DoD supported research and development results. This project responds to Public Law 102-564.

C. JUSTIFICATION FOR PROJECT:

FY 1993 Plans:
- Support the Small Business Administration (SBA) National Direction by actively seeking small business contractors to perform innovative nuclear weapons effects research.
- Continue active support of the SBA National Directive.

FY 1994 Plans:
- Continue active support of the SBA National Directive.

Work Performed By: Physitron, Inc., Huntsville, AL; Geo-Centers, Inc., Westwood, MA; Ares Corp., Arlington, VA; General Sciences, Inc., Norris, PA; Science & Engineering Assoc., Albuquerque, NM; Orion International Technologies, Albuquerque, NM; Carpenter Research Corp., Rolling Hill Estates, CA; Aptek, Inc., Colorado Springs, CO; Ktech Corp., Albuquerque, NM; Dese Research, Inc., Huntsville, AL; Anro Engineering Consultants, Inc., Bedford, MA; System Control Inc., Palo Alto, CA; Tetra Corp., Albuquerque, NM; Science Research Lab, Inc., Summerville, MA; ENSCO, Inc., Springfield, VA; Mission Research Corp., Santa Barbara, CA; Hy-Tech Research Corp., Redford, VA; Electro-Optek, Torrance, CA; Berkeley Research Assoc., Berkeley, CA; EIC Laboratories, Inc., Norwood, MA; North Star Research Corp., Albuquerque, NM; Optron Systems, Inc., Bedford, MA; D.H. Valles Assoc., Albuquerque, NM; Ibis Technology Corp., Danvers, MA; and UTD, Inc., Alexandria, VA.

Related Activities: None.

Other Appropriation Funds: None.

International Cooperation Agreements: None.

Program Element: #0603711H Budget Activity: Strategic Programs
PE Title: Verification Technology Demonstration Date: April 1993

A. RESOURCES ($ in Thousands)

Project Number & Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate	Total Program
CA Strategic Arms Control Technology	21,245	9,531	13,462	Continuing
CB Conventional Arms Control Technology	16,739	14,888	11,423	Continuing
CC Chemical Weapons Convention Technology	22,500	21,604	21,465	Continuing
CD Yield Measurement Technology	12,520	10,818	- 0 -	51,621
CE Safe Secure Dismantlement	1,975	- 0 -	- 0 -	1,975
TOTAL	74,979	56,841	46,350	

B. BRIEF DESCRIPTION OF ELEMENT: This program element covers verification and compliance RDT&E for arms control treaties including Strategic Arms Reduction Talks (START) and START II, Conventional Forces in Europe (CFE), Threshold Test Ban Treaty, Peaceful Nuclear Explosions Treaty, Chemical Weapons Convention (CWC), Open Skies, Presidential arms control initiatives and other arms control related agreements such as the Conference on Security and Cooperation in Europe.

The program includes development of hardware and techniques for on-site inspections in treaty nations and assists the Office of the Secretary of Defense in preparing for U.S. compliance with treaty provisions. Hardware and procedures developed are transitioned to the On-Site Inspection Agency (OSIA) (or appropriate international inspectorate in the case of CWC) for use in conducting inspections as required by arms control treaties.

Where applicable, RDT&E to meet one treaty's requirements is applied in other areas, eliminating duplicative efforts and maximizing synergistic results. For example, the START Treaty requires monitoring of vehicles exiting a final assembly factory for treaty limited items. The Portal Perimeter Continuous Monitoring System was designed and developed to meet START specifications. It was transitioned to OSIA in March 1992 for use by Entry-Into-Force (EIF), 30 days after ratification. This same RDT&E effort resulted in valuable information for negotiators to use in developing the U.S. position for monitoring sites under a CWC regime.

Another example of the broad nature of the DNA effort is reflected by the data management development effort. Arms Control treaties require extensive exchanges of data describing treaty accountable items, initial declarations, movements, etc., of signatory nations. DNA has developed a data management system, the Compliance Monitoring Tracking System (CMTS), to accommodate these data exchanges and monitor U.S. compliance with treaty provisions. Currently CMTS can provide treaty required data exchanges for Intermediate Range Nuclear Forces, START, CFE and Confidence and Security Building Measurements. Work is underway to define START II Central Data System requirements. The Open Skies Notification System is being developed to support a July 93 EIF. The Chemical Weapons Convention Information Management System demonstration model is being reviewed by the U.S. Interagency to determine whether it will be provided to the International Organization at the Hague. At completion, DNA will turn over operation of CMTS to OSIA.

The Nunn-Lugar Soviet Nuclear Threat Reduction Act of 1991, provides for assistance in the safe secure dismantlement of nuclear and other weapons of mass destruction to the Former Soviet Union.

Program Element: #0603711H
PE Title: Verification Technology Demonstration
Project Number: CA
Budget Activity: Strategic Programs

A. RESOURCES: ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Strategic Arms Control Technology	21,245	9,531	13,462

B. BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEMS CAPABILITIES: This project consists of RDT&E activities required to implement U.S. rights under the Strategic Arms Reduction Talks (START) and START II Treaties, assist U.S. manufacturers in compliance with the Treaty, and development of technology which will meet requirements of future nuclear arms control agreements. Treaty on-site inspection requirements resulted in a Portal and Perimeter Continuous Monitoring Systems (PPCMS) which is expected to be deployed in the Ukraine after the START Treaty Entry-Into-Force (EIF) during 3rd quarter, 1993. A portable weigh-in-motion system is being evaluated for accurately weighing ballistic missiles on their transporters. A START Central Data System (SCDS), as part of the Compliance and Monitoring Tracking System (CMTS) was developed to enable the U.S. to make Treaty required notifications and compliance assessments. The START II Treaty, signed in January 1993, must be assessed to determine future requirements. In addition, procedures to accommodate inspections at U.S. rocket motor production facilities were developed and demonstrated. Technology development efforts are planned to satisfy future treaty requirements in the most non-intrusive and cost effective manner. The primary focus of the efforts is on more effective methods of counting nuclear warheads in situ, determining missile throw-weight, measuring characteristic Treaty Limited Item (TLI) signatures, and providing monitoring/inspection capabilities at lower cost.

C. PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1992 Program:
- PPCMS transitioned to On-Site Inspection Agency and long-lead time items transferred.
- Development of START Central Data System continued. Operational testing was successful and the Air Force and Navy data systems interface was accomplished. Notifications for Intermediate Range Nuclear Forces (INF) were added.
- Phase II Baseline Evaluation of portable scales was conducted. The effort was redirected since no system fully met requirements. A static system was tested and met requirements.
- Developed plans to facilitate preparation for suspect-site inspections, special access visit and other START Treaty implementation actions.
- Conducted analysis of START and INF implementation costs.
- Provided quick-reaction technical support to meet Joint Compliance and Inspection Commission (JCIC) requirements.
- Initiated the Re-entry Vehicle (RV) Counting concept study.
- Began development of signatures exploitation systems--gravimetry, acoustic, and nuclear.
- Defined gravity models and developed profiles for nuclear and non-nuclear cruise missiles.
- Completed a peer review and materials/mock-up experiments of Cosmic Ray Induced Neutron Signature lab-prototype system.
- Completed a study to identify alternatives to CARGOSCAN, identified specifications for a transportable system, and evaluated proposals for follow-on development efforts.
- Tested the Acoustic Resonance Spectroscopy lab-prototype on several ballistic missiles to determine if a signature could be identified.
- Defined requirements for throw-weight determination package sensors.
- Completed Secure Loop Inspectable Tag/Seal (SLITS) and Universal Reader development.
- Acquired the Small Intercontinental Ballistic Missile ground test missile from the Air Force.

- Initiated an Adjunct Monitoring Study to define scenarios and technology for remote monitoring tools.
- Initiated the Innovative Treaty Sensor Integrator project to provide inspectors with tools to assist in identifying Treaty Limited Items.
- Conducted adversarial analysis vulnerability testing of video motion detection systems.
- Manufactured three (3) sealed, tamper-protected container prototypes for the On-Site Inspection Agency.

FY 1993 Planned Program:
- Transition the Technical On-Site Inspection (TOSI) facility for use as a Testbed for Arms Control Technology (TACT), which could be used as a demonstration facility for equipment developed and procured under the Safe Secure Dismantlement Program. Install the SICBM at TOSI.
- Continue to demonstrate the static weighing system and continue research on a lighter weighing system.
- Revise planning aids to update manufacturers on arms control inspections requirements based on inputs from studies of potential new agreement verification regimes.
- Conduct modeling of systems to verify the number of RVs carried on a ballistic missile.
- Develop and test laboratory prototypes of spin resonance gravity gradiometer and other selected acoustic and nuclear signature exploitation systems.
- Begin development of one of the Adjunct Monitoring study recommendations.
- Begin development of new radiographic system(s) selected as a result of the radiography concept study recommendations and test laboratory prototype(s).
- Conduct prototype development and testing efforts on new systems and other instrumentation for remote monitoring applications. Validate selected data authentication systems.
- Develop a START II Central Data Systems (SCDSII).
- Provide technical support to the Joint Compliance and Inspection Commission (JCIC), Special Verification Commission and Bilateral Implementation Commission (BIC).
- Complete SCDS development and documentation.

FY 1994 Planned Program:
- Continue to maintain, operate and upgrade the TACT.
- Upgrade the SCDS based on user inputs.
- Complete SCDS II development and demonstration.
- Evaluate improved weigh-in-motion system.
- Conduct a missile demilitarization study.
- Provide technical/programmatic support to Office of the Secretary of Defense (OSD)/SAC&C (Strategic Arms Control and Compliance).
- Continue analysis of START/INF implementation costs and conduct cost benefit analyses of selected projects.
- Provide technical support to the JCIC, BIC, and Special Verification Commission (SVC).
- Continue development of improved systems to determine if limits on the number of reentry vehicles on a missile is in compliance with treaty provisions.
- Test, document and transition an improved non-damaging imaging system.
- Continue efforts on the gravity gradiometer development and demonstration.
- Test prototypes of adjunct monitoring systems.
- Cooperative teaming with national laboratories to identify advanced verification concepts and technologies.

D. WORK PERFORMED BY: Sandia National Laboratory, Albuquerque, NM; Lawrence Livermore National Laboratory, Livermore, CA; Los Alamos Laboratory, Los Alamos, NM; Institute for Defense Analyses, Alexandria, VA; Raytheon, Burlington, MA; Science Application International Corp., McLean, VA; BDM, Albuquerque, NM and McLean, VA; Systems Planning Corporation, Arlington, VA; Meridian, Alexandria, VA; MITRE, Burlington, MA; JAYCOR, Vienna, VA; Waterways Experimentation Station Army Corps of Engineers, Vicksburg, MS; Electronic Systems Center, Hanscom AFB, MA; and the Analytic Sciences Corporation, Arlington, VA.

E. COMPARISON WITH FY 1993 DESCRIPTIVE SUMMARY: No significant change.

F. PROGRAM DOCUMENTATION: DNA conducts RDT&E programs for cooperative inspection technologies related to arms control treaty verification; requirements are provided by the DoD treaty manager and are reflected in the OSD Master Plan.

G. RELATED ACTIVITIES: None.

H. OTHER APPROPRIATION FUNDS: None.

I. INTERNATIONAL COOPERATIVE AGREEMENTS: START and Follow-on Treaties.

J. MILESTONE SCHEDULE:

- Treaty to Senate:	25 Nov 91
- Senate Vote:	1 Oct 92
- START II Treaty signed:	3 Jan 93
- START II to Senate:	15 Jan 93
- START EIF:	3rd Qtr FY93
- START II Entry-Into-Force:	3rd Qtr FY93
- START Baseline Inspections Begin:	3rd Qtr FY93
- PPCMS Deployment Begins:	3rd Qtr FY93
- START Special Access Visits Begin:	1st Qtr FY94

Program Element: #0603711H
PE Title: Verification Technology Demonstration
Project Number: CB
Budget Activity: Strategic Programs

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Conventional Arms Control Technology	16,739	14,888	11,423
(CFE Aerial Inspection/Open Skies)	(8,300)	(8,135)	(4,597)

B. BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEMS CAPABILITIES: This project covers RDT&E required to meet inspection technology requirements, ensure compliance, and implement existing, emerging, and potential treaties, agreements, and initiatives related to conventional arms control (CAC). Relevant agreements include: (1) the Conventional Forces in Europe (CFE) Treaty, ratified by the U.S. in December 1991 (and its follow-on, CFE-1A, signed by the member states July 1992), and entered into force July 1992; (2) the Treaty on Open Skies, signed by member states March 1992 (projected Entry-Into-Force June 1993); and (3) the Agreement on Confidence and Security Building Measures (CSBM's), signed November 1990. The RDT&E needs for emerging treaty and agreement areas include: (1) the Conference on Security and Cooperation in Europe (CSCE) Review Conferences, with its CSCE Forum for Security Cooperation; (2) regional/subregional peace-keeping and conventional arms proliferation issues; (3) enhancing Confidence and Security Building Measures; and (4) United Nations initiatives related to Transparency In Armaments (TIA) reporting. This project develops hardware and techniques to support on-site and other inspection modes, Open Skies, and provides technology and aids for U.S. compliance, e.g., a supporting data base for treaty information - the Data Management/Notification System (DMNS) and Open Skies Notification System (part of the Compliance Monitoring Tracking System (CMTS)).

C. PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1992 Program:
- Assessed and recommended European inspection technologies for development.
- Completed initial DMNS development; established DNA DMNS test bed.
- Initiated assessment of Passive Millimeter Wave Imaging.
- Completed examination of signatures associated with conventional armaments proliferation scenarios for inspection requirements definition.
- Completed assessment of issues relating to transferability of U.S. technologies proposed for compliance monitoring.
- Assessed issues and inspection technology RDT&E requirements related to emerging and potential regional/subregional CAC regimes; determined technology issues and requirements associated with the UN's Transparency in Armaments initiative.
- Completed analysis of naval verification issues.
- Revised inspector Treaty Limited Equipment (TLE) identification aids.
- AI/OS: defended final user requirements for mission manager; defined synthetic aperture radar (SAR) requirements, initiated development program and recommendation; initiated assessment of U.S vulnerabilities to Open Skies observation flights through modeling; initiated Open Skies notification system.
- Initiated analysis and evaluation of Russian film and processing for Open Skies.

FY 1993 Planned Program:
- Integrate CSBM reporting; transition central host nodes to UNIX operating system; integrate UNIX into DNA DMNS test bed; define requirements to develop automated analytical tool to access data from various arms control related data bases.
- Transition central host node of DMNS to the On-Site Inspection Agency (OSIA) and maintain the DNA test bed to implement potential upgraded software.
- Identify RDT&E requirements related to emerging and potential regional/subregional CAC regimes, including the Middle East, Northeast Asia, and India/Pakistan.
- Determine data integration, correlation, interpretation, and extrapolation requirements associated with CFE, Open Skies, and other arms-control regimes.
- Assess enhanced technologies for upgrading treaty regimes.

- Continue Open Skies SAR development; deliver Open Skies (OS) mission manager; continue vulnerabilities modeling; identify and execute OS unique compliance and implementation technology RDT&E requirements.
- Determine impact of existing and potential export controls on acquisitions related to modernization of conventional forces and to technologies associated with existing, emerging, and potential conventional arms-control regimes.
- Initiate RDT&E on Open Skies media archiving and processing needs.
- Analyze available, and recommend appropriate, environmental sensors for potential trainer integration with Open Skies observation platforms.
- Expand and/or modify CMTS/DMNS to meet Open Skies Notification System (OSNS) requirements.

FY 1994 Planned Program:
- Provide support to negotiators and maintain program continuity.
- Determine new technology RDT&E requirements related to allowed upgrades, enhancements, and improvements to Open Skies sensors; support negotiators; fully integrate upgrade mission manager capabilities for Open Skies regime; continue OSNS modification for Open Skies requirements.
- Determine new technology RDT&E requirements related to ensuring U.S. ability to implement and comply with provisions of existing, emerging, and potential CAC regimes.
- Develop and pursue technologies/techniques to meet identified data integration, correlation, interpretation, and extrapolation requirements.
- Determine requirements for discriminating advanced conventional weapons capabilities.
- Continue permitted Open Skies sensor improvements.

D. WORK PERFORMED BY: Institute for Defense Analysis, Alexandria, VA; BDM, McLean, VA; System Planning Corporation, Alexandria, VA; Argonne National Laboratory, Argonne, IL; Northrop Corporation, Pico Rivera, CA; Sandia National Laboratory, Albuquerque, NM; Science Applications International Corporation, McLean, VA; Jaycor, Vienna, VA; Meridian Corporation, Alexandria, VA; National Security Planning Associates, Washington, DC.

E. COMPARISON WITH FY 1993 DESCRIPTIVE SUMMARY: The current program emphasis reflects efforts to meet existing and emerging CAC requirements from the Conference on Security and Cooperation in Europe (CSCE) and from the Treaty on Open Skies in addition to specific CFE Treaty driven Research, Development, Test and Evaluation. This is a result of the signing of the Treaty on Open Skies and the provisional entry-into-force (EIF) of the CFE Treaty as well as provisions for confidence and security building measures. Programs now emphasize RDT&E efforts to support Open Skies, CSBM's, upgrade to CFE DMNS, RDT&E for Open Skies data management capabilities and its implementation, RDT&E to support the Forum for Security Cooperation, and other potential conventional arms limitations regimes and approaches which may emerge from initiatives by such organizations as the United Nations. Outyear programs continue to emphasize existing CAC regimes as well as the proactive RDT&E requirements identification related to emerging regional/subregional conventional arms control regimes (including the Middle East, Northeast Asia, southern republics of the former Soviet Union, India, and Pakistan) and conventional weapons proliferation verification and monitoring regimes.

NARRATIVE DESCRIPTION OF CHANGES

1. TECHNICAL CHANGES: None.
2. SCHEDULE CHANGES: Full UNIX migration is later than originally projected due to negotiated changes to the notifications; establishment of the Forum for Security Cooperation, to initially meet in September 1992, dictates earlier consideration of RDT&E to support any conventional arms control, CSBM's, or other initiatives.
3. COST CHANGES: Signature of the Treaty on Open Skies has shifted funding emphasis to meet the more immediate RDT&E requirements of providing an appropriate sensor suite, integrated on a satisfactory airborne platform, for fulfilling the provisions of the Treaty. The dynamics of the changing world political and security environment require more timely assessment of technology RDT&E needs related to emerging and potential, regional/subregional arms control issues and initiatives.

F. PROGRAM DOCUMENTATION: Appointed as executive agent for arms control treaty related RDT&E, requirements are developed in conjunction with the Conventional Arms Control and Compliance Directorate, OSD(A) and OSD(P)/ESN. Efforts affecting several treaties are coordinated through the Forum on Arms Control Technology.

G. RELATED ACTIVITIES: None.

H. OTHER APPROPRIATION FUNDS: None.

I. INTERNATIONAL COOPERATIVE AGREEMENTS: CFE Treaty signed 19 Nov 90, ratified Dec 91, entered into force 17 Jul 92; Confidence and Security Building Measures Agreement signed 19 Nov 90, expanded and modified in the Vienna Document 92, signed 29 Feb 92 and entered into force 1 May 92; the Treaty on Open Skies, signed 24 Mar 92, EIF anticipated in June 1993.

J. MILESTONE SCHEDULE:

- CFE Treaty ratified by U.S.:	Dec 91
- Vienna Document 92 Signature:	Feb 92
- CSCE Review Conference begins:	Mar 92
- Treaty on Open Skies Signature:	Mar 92
- Vienna Document 92 (CSBM's) Entry-Into-Force:	May 92
- CFE/CFE IA Treaty Entry-Into-Force:	Jul 92
- CFE updated data exchange:	Aug 92
- Forum for Security Cooperation (FSC) begins meeting:	Sep 92
- Annual CFE data exchange:	Dec 92
- Open Skies Entry-Into-Force:	Jun 93
- Initial TIA information submission:	Apr 93
- Open Skies Flights begin:	Sep 93
- TIA review:	Jul 95
- CFE Eliminations/Reduction Period Complete:	Nov 95
- Follow-on Open Skies aircraft with full sensor suite of Treaty-permitted sensors operational:	Jan 97

Program Element: #0603711H Project Number: CC
PE Title: Verification Technology Demonstration Budget Activity: Strategic Programs

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Chemical Weapons Convention Technology	22,500	21,604	21,465

B. BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEMS CAPABILITIES: This project conducts RDT&E required for multinational verification and U.S. compliance with the Draft Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction (CWC) and other chemical arms control agreements. It includes development of means to facilitate compliance with treaty provisions, primarily through conduct of on-site inspections and U.S. planning for compliance activities. The project also performs costing studies, technology assessments, impact, and implementation plans.

C. PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1992 Program:
- Completed equipment field trials to validate operational concepts and identify baseline equipment requirements for inspections.
- Completed System Field Demonstrations to integrate equipment and procedures into baseline verification systems.
- Completed an assessment of CWC applications of site monitoring technologies.
- Completed an assessment of CWC applications of seals and tags.
- Continued to identify technology gaps for development of enhanced inspection equipment and began development of those systems.
- Continued development of a prototype international CWC Information Management System to process declarations and inspection data.
- Continued to assess the chemical signatures of CW activities applicable to compliance monitoring.
- Continued development and testing of non-destructive evaluation systems and selected final systems for engineering development.
- Established a capability for independent test and evaluation of CWC verification technologies and procedures.
- Initiated a program to identify, evaluate, and develop new sampling and analytical technologies for CWC applications.
- Initiated development of a CWC inspector training program.
- Initiated development of a hand-held microchip gas chromatograph chemical detector.

FY 1993 Planned Program:
- Complete development of the prototype international CWC Information Management System.
- Complete development of an integrated training program for CWC inspectors.
- Complete prototype of the hand-held microchip gas chromatograph chemical detector and begin engineering development.
- Continue to identify technology gaps during the test and evaluation of baseline verification inspection systems.
- Continue to evaluate emerging sampling and analytical technologies as they become available.
- Continue development of enhanced verification inspection systems.
- Provide technical support to U.S. compliance and implementation planning efforts.
- Begin development of a Toxin Detector for CWC listed toxins.
- Begin engineering development of selected non-destructive evaluation systems.
- Begin development of a methodology for assessing the adequacy of facility destruction verification measures.
- Begin to provide technical support to the U.S. representative to the CWC Preparatory Commission.
- Begin transition of baseline equipment and procedures to the Preparatory Commission and the Provisional Technical Secretariat.

FY 1994 Planned Program:
- Complete development of selected non-destructive evaluation systems.
- Complete development of a methodology for assessing the adequacy of facility destruction verification measures.
- Complete engineering development of the hand-held microchip gas chromatograph chemical detector.
- Continue to identify technology gaps during the test and evaluation of baseline verification inspection systems.
- Continue to evaluate emerging sampling and analytical technologies as they become available.
- Continue development of a CWC Toxin Detector.
- Continue to develop enhanced verification inspection systems.
- Continue to provide technical support to the U.S. representative to the CWC Preparatory Commission.
- Continue to provide technical support to U.S. compliance and implementation planning efforts.
- Develop prototype for managed access for CWC Inspections.
- Continue transition of baseline equipment and procedures to the Preparatory Commission and the Provisional Technical Secretariat.
- Begin development of the definitive international CWC Information Management System from the prototype.
- Support preparation for execution of the CWC inspector training program.

D. WORK PERFORMED BY: US Army Chemical Research, Development and Engineering Center, Aberdeen Proving Grounds, MD; US Army Dugway Proving Ground, Dugway, UT; US Army Chemical School, Anniston, AL; US Army Medical Research Institute of Infectious Diseases, Fort Detrick, MD; Tooele Army Depot, Tooele, UT; Air Force Technical Applications Center, Patrick AFB, FL; Los Alamos National Labs, Los Alamos, NM; Sandia National Labs, Albuquerque, NM; BDM International, Inc., McLean, VA; Systems Planning Corporation, Arlington, VA; Raytheon Services Company, Burlington, MA; Institute for Defense Analyses, Alexandria, VA; Battelle Memorial Institute, Edgewood, MD; Science Applications International Corporation, Newington, VA; General Research Corporation, Santa Barbara, CA; Meridian Corporation, Alexandria, VA; Jaycor, Vienna, VA.

E. COMPARISON WITH FY 1993 DESCRIPTIVE SUMMARY: No significant change.

F. PROGRAM DOCUMENTATION: The key document is the Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction (CWC). Requirements are also delineated by the treaty manager, the Assistant to the Secretary of Defense (Atomic Energy) OASD(AE), and are coordinated with the DoD's Forum for Arms Control Research and Development and the interagency Verification Technology Working Group CW Task Force.

G. RELATED ACTIVITIES: Work is being conducted as part of the Chemical Stockpile Disposal Program by the US Army Program Manager for Chemical Demilitarization to meet a Congressionally mandated requirement for destruction of the US chemical weapons stockpile. Also, compliance planning and implementation efforts related to the US/Russian bilateral agreements and the CWC are being conducted by the services with coordination provided by OASD(AE).

H. OTHER APPROPRIATED FUNDS: None.

I. INTERNATIONAL COOPERATIVE AGREEMENTS: The Convention on the Prohibition of the Development, Production, Stockpiling, and Use of Chemical Weapons and on Their Destruction; the US/USSR Memorandum of Understanding signed at Jackson Hole, WY, 23 Sep 89; the US/USSR Destruction Memorandum of Agreement signed at Moscow, May 90; the Research Agreement between the US Arms Control and Disarmament Agency

and the Japan Atomic Energy Research Institute for the development and testing of remote monitoring technology signed Jan 91; and the US/UK/Canada Memorandum of Understanding on the Cooperative Program on Research, Development, Production, and Procurement of Chemical and Biological Defense Material, ITF-11 Technologies for CWC Verification signed Mar 90.

J. MILESTONE SCHEDULE:

- CWC Signed	Jan 93
- Preparatory Commission Established	Feb 93
- CWC Entry-Into-Force	Mar 95

FY 1994 BUDGET ESTIMATES

Program Element: #0603711H Project Number: CD
PE Title: Verification Technology Demonstration Budget Activity: Strategic Programs

A. RESOURCES ($ in Thousands)

Project Title	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Yield Measurement Technology	12,520	10,818	- 0 -

B. BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEMS CAPABILITIES: Yield Measurement Technology provides the technical and operational capability to field the HYDROPLUS measurement package on underground nuclear tests in Russia to verify yield compliance in non-standard test geometries in accordance with Threshold Test Ban Treaty protocols. This technology program includes all necessary instrumentation and gauge construction, fielding support, data reduction, and analysis for technology validation in the U.S. and for actual yield verification operations in Russia. This also provides for creation and updating of the HYDROPLUS database and for improvements in HYDROPLUS instrumentation and gauge packages.

C. PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1992 Program:
- Completed arctic climate practice deployment at the Army's Cold Regions Research Engineering Laboratory.
- Completed purchase of the third HYDROPLUS verification equipment system.
- Deployed complete instrumentation system on an underground test.

FY 1993 Planned Program:
- Develop detailed procedures manuals for HYDROPLUS deployment/assembly/installation, surveying/coring/logging, void detection, geology evaluation, laboratory testing, and yield analysis.
- Terminate effort to develop the "production" level HYDROPLUS monitoring equipment.
- Transport and "mothball" the prototype HYDROPLUS recording, power generation, command and monitoring, and geotechnical vans to a secure storage area.
- Complete assessment of improved void detection equipment and validate the new procedure.
- Complete field exercises to train HYDROPLUS designated personnel.
- Complete data analysis and document results from the FY 1992 underground test.

D. WORK PERFORMED BY: S-Cubed, La Jolla, CA; Science Applications International Corporation, San Diego, CA; California Research & Technology, Inc., Chatsworth, CA; Stanford Research International, Menlo Park, CA; R & D Associates, Albuquerque, NM; Bendix, Las Vegas, NV.

E. COMPARISON WITH FY 1993 DESCRIPTIVE SUMMARY: Recognizing the uncertainty of a resumption of nuclear testing by Russia, the yield measurement program has been terminated effective FY 1994.

F. PROGRAM DOCUMENTATION:
- Threshold Test Ban Treaty Protocol
- National Security Directive

G. RELATED ACTIVITIES: Program Elements 0305135BA (O&M, PDA, MILCON), On-Site Inspection Agency, Supporting Activities; 0305089BA (O&M, PDA), OSIA Management Headquarters; 00305136BA (O&M, PDA), OSIA Operations Communications; 0602714E, DARPA. There is no duplication.

H. OTHER APPROPRIATION FUNDS: None.

I. INTERNATIONAL COOPERATIVE AGREEMENTS: The Threshold Test Ban Treaty and its Protocols.

J. MILESTONE SCHEDULE:

- Terminate effort to develop "production" level monitoring equipment	Oct 92
- High explosive test in saturated, fractured limestone	Jul 93
- High explosive test in hard rock (shale)	Aug 93
- Improve void detection equipment	Aug 93
- Validate void detection procedure	Oct 93
- "Mothball" prototype HYDROPLUS vans in secure storage area	Sep 93
- Complete detailed procedures manuals	Dec 93

FY 1994 BUDGET ESTIMATES

Program Element: #0603711H Project Number: CE
PE Title: Verification Technology Demonstration Budget Activity: Strategic Programs

A. RESOURCES ($ in Thousands)

Project Title Popular Name	FY 1992 Actual	FY 1993 Estimate	FY 1994 Estimate
Safe Secure Dismantlement	1,975	-0-	-0-

B. BRIEF DESCRIPTION OF MISSION REQUIREMENT AND SYSTEMS CAPABILITIES: On March 29, 1992, the President delegated to the Secretary of Defense the authority for establishing and executing a program to assist in the safe secure destruction of nuclear and other weapons of mass destruction in the Former Soviet Union (FSU), pursuant to House Resolution (H.R.) 3807 (Title II), as referenced in Public Law (P.L.) 102-229 (Section 108).

The Assistant to the Secretary of Defense for Atomic Energy, OASD(AE), has been delegated the management responsibility for this effort in the Department of Defense and in a memorandum dated January 11, 1993, delegated to DNA the responsibility to execute that portion of program management concerning individual projects, with the exception of the Russian Chemical Weapons Destruction Assistance program, from the time an implementing agreement with an FSU Republic is signed, through to final delivery of agreed products or services. Specific tasks will continue to be defined pursuant to agreements between the U.S. and FSU Republics. Funds will be provided for activities conducted FY 1993 - FY 1995 in the execution years as required.

C. PROGRAM ACCOMPLISHMENTS AND PLANS:

FY 1992 Program:
- Developed, tested and evaluated prototype armored blankets. Developed specications for production.
- Developed, tested and evaluated prototype fissile material containers. Developed procurement specifications.
- Developed, tested and evaluated security systems for railcars to transport nuclear materials.

D. WORK PERFORMED BY: Science Applications International, McLean, VA.

E. COMPARISON WITH FY 1993 DESCRIPTIVE SUMMARY: This is a new start.

F. PROGRAM DOCUMENTATION:
a) 29 March 1992 Memorandum, from the President, delegating the Secretary of Defense the authority for establishing and executing a program for assistance in the safe secure destruction of nuclear and other weapons of mass destruction.
b) House Resolution (H.R.) 3807 (Title II) as referenced in Public Law (P.L.) 102-229 (Section 108).
c) 31 March 1992 Memorandum from USD(A), delegating the program management responsibility to OASD(AE).
d) 11 January 1993 Memorandum, from OASD(AE), delegating program management to DNA.

G. RELATED ACTIVITIES: Freedom for Russia and Emerging Eurasian Democracies and Open Markets Support Act of 1992.

H. OTHER APPROPRIATION FUNDS: Funds made available for the SCL efforts have been provided by appropriation as applicable for tasks. Other appropriation funds (PE 35115H) as follows:

	$000		
	92	93	94
(O&M)	1590	16629	-
(PDA)	8675	13860	-
(MILCON)	500	4500	-

I. INTERNATIONAL COOPERATIVE AGREEMENTS:

a) 17 June 1992: Umbrella Agreement between the U.S. Government (USG) and the Russian Federation concerning the Destruction and Safeguarding of Weapons and the Prevention of Weapons Proliferation.

b) 17 June 1992: Agreement between Department of Defense (DoD) and the Ministry of Atomic Energy, Russia (MINATOM) concerning The Safe and Secure Transportation and Storage of Nuclear Weapons Through the Provisions of Armored Blankets.

c) 17 June 1992: Agreement between DoD and MINATOM concerning The Safe and Secure Transportation and Storage of Nuclear Weapons through the Provision of Emergency Response Equipment.

d) 17 June 1992: Agreement between DoD and MINATOM concerning The Safe and Secure Transportation and Storage of Nuclear Weapons through the Provision of Fissile Materials Containers.

e) 17 June 1992: Agreement to provide financial assistance for detailed planning and resource management to expedite CW demilitarization activities.

f) 28 August 1992: Agreement between the DoD and MINATOM concerning the Provision of Cargo and Guard Railcar Conversion Kits.

g) 6 October 1992: Agreement between the DoD and Russia for design of a Safe Secure and Ecologically Sound Storage Facility for Fissile Material Derived from the Destruction of Nuclear Weapons.

h) 22 October 1992: Umbrella Agreement between the USG and Belarus concerning Emergency Response and the Prevention of Proliferation of Weapons of Mass Destruction.

i) 22 October 1992: Agreement between the DoD and Ministry of Defense of the Republic of Belarus concerning the establishment of Export Control Systems.

j) 22 October 1992: Agreement between the DoD and the Ministry of Defense of the Republic of Belarus concerning the provision of Emergency Response Equipment.

k) 27 November 1992: Agreement between the USG and Russia establishing an International Science and Technology Center.

l) 15 January 1993: Agreement between DoD and the Ministry of Defense of the Republic of Belarus concerning the establishment of Continuous Communications Links.

m) 18 February 1993: Agreement between the USG and Russia concerning the Disposition of Highly Enriched Uranium Extracted from Nuclear Weapons.

J. MILESTONE SCHEDULE:

- Performance accomplished in accordance with specific tasks as required.